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Greater Trochanteric Pain Syndrome in the UK National Health Service: A multi-centre service evaluation

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1. INTRODUCTION

Greater Trochanteric Pain syndrome (GTPS) is a debilitating condition causing lateral hip pain (Grimaldi & Fearon, 2015). It affects up to 23.5% of women and 8% of men between 50-75 years old (Segal et al., 2007). Existing data suggests that patients with GTPS report difficulty sleeping; and moderate to severe pain and disability, and comparable quality of life to people with advanced osteoarthritis of the hip (Fearon et al., 2013; Fearon et al., 2014). Originally considered an inflammatory condition of the trochanteric bursa; recent imaging, surgical and histology studies have suggested it to be, most commonly, a condition associated with tendinopathy of the gluteus medius and minimus tendons at the site of their insertion onto the greater tuberosity of the femur (Fearon et al., 2010; Long, Surrey & Nazarian, 2013).

A recent randomised controlled trial (LEAP trial) reported 78.5% success rates on the global rating of change scale with education and exercise interventions for patients with GTPS (Mellor et al., 2018). These outcomes were superior to cortico-steroid injection (58.3%) and wait and see (51.9%) approaches at 12-months post intervention (Mellor et al., 2018). However, the patients recruited to this study were community dwellers and not patients seeking healthcare interventions. Patients were also excluded if they had advanced osteoarthritis of the hip (>2 Kellgren Lawrence scale) or knee, low back pain (>2/10), systemic inflammatory diseases, or systemic diseases affecting the muscular or nervous system (Mellor et al., 2016). Current data suggests that patients with GTPS are often overweight, and complain of low back pain, osteoarthritis of the spine or ipsilateral hip or knee (Segal et al., 2007). GTPS is more common in post-menopausal women, and has also been shown to be highly prevalent in patients awaiting renal transplant (Demant et al., 2007; Lievense et al., 2015). The extent to which co-morbidities are present, and the impact of them in patients with GTPS is unknown, yet cardiovascular, hormonal and endocrine disorders are known risk factors for developing other lower limb tendinopathies (Abate, Schiavone, Salini & Andia, 2013). Age, gender, family support, severity of symptoms, greater healthcare needs due to chronic conditions, and beliefs about disease and ability of healthcare to change it, are all factors which

influence healthcare seeking behaviour (Cornally & McCarthy, 2011; Thompson et al., 2016;). Many of these factors are also risk factors for musculoskeletal pain (Artus et al., 2017; Linton & Shaw, 2011; Valentin et al., 2016).

Little is known about the characteristics of patients with GTPS who present to physiotherapy services within the National Health Service (NHS). Given the range of risk and prognostic factors associated with GTPS, it is important to understand these characteristics to enable consideration of the applicability of the findings of the LEAP trial to typical NHS patients. Hence the primary aim of this multi-site service evaluation was to collect and synthesise data on the characteristics of patients with a primary complaint of GTPS, presenting to the NHS. As a secondary aim, the characteristics of these NHS patients will then be compared with the participants recruited to the LEAP trial, to provide context of the trial results for an NHS population.

2. METHODS

Recruitment and data analysis

Four eligible NHS sites from the United Kingdom (UK) responded to a request via Twitter to share anonymised data. The request was aimed at clinicians working within NHS physiotherapy services who had collected data and outcome measures for patients presenting with a primary complaint of GTPS, as part of their routine care over the previous twelve-month period. The request explained the aim of the data collection was to characterise the typical patient who presents to the NHS with GTPS. Examples of the type of information required (age, gender, medical history, duration and distribution of symptoms) was explained in the initial request. Individuals who responded to the request were sent the data capture excel spreadsheet (Appendix 1) to enable them to complete local governance approval prior to sharing any data.

The participating sites were made up of two Clinical Musculoskeletal Assessment and Treatment Services (CMATS), one General Hospital and one elective Orthopaedic Hospital. Each site was asked to randomly select approximately 40 patients that had been seen within their service between April 2017 and April 2018, presenting for treatments of lateral hip pain and given a clinical diagnosis of GTPS by the treating physiotherapist in either Consultant led, or physiotherapy out-patient clinics. A clinical diagnosis was accepted for inclusion as clinical testing for GTPS has a high diagnostic validity and physiotherapists in the UK appear confident with a clinical diagnosis for the condition (Ganderton et al., 2017; Stephens et al., 2019). Three sites chose the first forty patients for the given time period who fitted the criteria; whilst one site identified eligible patients at random. The only inclusion criteria applied was a diagnosis of GTPS by the treating clinician, to ensure the sample most accurately reflected the patient who seeks care in the NHS. The domains identified for inclusion in the data capture tool were pre- determined by the lead author (GS) and two co-authors (CL, SON).

Sites were informed that the anonymised data would be used to define the characteristics of patients with GTPS, attending the NHS.

Medical conditions were classified using the World Health Organisation, International Classification of Diseases 11th Revision (World Health Organisation, 2018) and medications were categorised using the British Medical Association, New guide to Medicine and Drugs, 9th Edition (2015).

Data were analysed descriptively using means, standard deviations and percentages, where relevant. Comparisons of the mean values to the LEAP trial were conducted using t-test for interval and ratio data and chi-squared analysis of categorical data.

Ethical Approval

Service evaluation, is a process which is used solely to define or judge current care, without reference to a standard (NHS Health Research Authority, 2016). This evaluation defined current care but focussed particularly on the characteristics of patients accessing physiotherapy services. This evaluation collated retrospective data, collected as part of routine clinical practice which had been completely anonymised at site before sharing. It therefore fulfilled criteria of a multi-site service evaluation which did not require NHS Health Research Authority ethical approval.

3. RESULTS

3.1 Patient characteristics

Overall, data on 162 subjects was collected and synthesised. The majority of patients were female (118/162; 73%), with an average age of 59 years of age, presenting with unilateral lateral hip pain (148/162; 91.4%) of more than 12-months in duration (92/162; 56.8%).

BMI data was obtained on 22.2% of subjects; of those the mean BMI was 28.4; and therefore, classified as 'overweight' (Table 1).

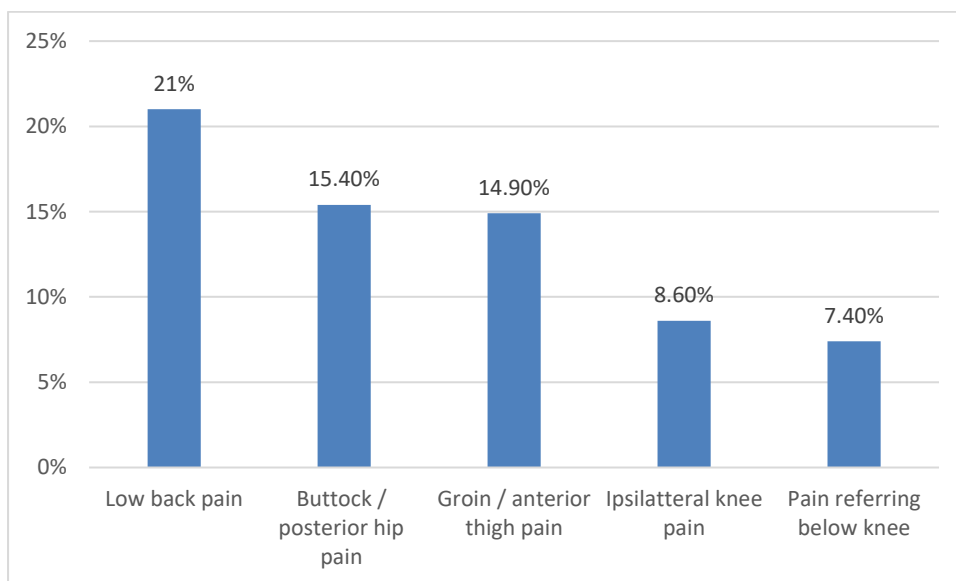
Table 1. Characteristics and presenting condition.

Characteristic	No. of subjects (% of subjects)	Mean (SD)	LEAP No. of subjects (% of subjects)	LEAP Mean (SD)	Mean differences (95% CI)	p-value
Male	44 (27%)		37 (18%)			
Female	118 (73%)		167 (82%)			
Age	162 (100%)	59.4 (13.7)	204 (100%)	54.8 (8.8)	4.6 (2.2 -6.92)	0.0001
BMI	36 (22.2%)	28.4 (5.1)	204 (100%)	27.4 (1.0)	1.0 (0.23-1.77)	0.012
Duration of symptoms						
2-6/12	40 (24.7%)		24 (11.8%)			0.001
6-12/12	30 (18.5%)		51 (25%)			0.14
>12/12	92 (56.8)		129 (63.2%)			0.21
Pain levels at assessment						
VAS (0-10)	114 (70.3%)	6.5 (2.1)	204 (100%)	4.9 (1.0)	1.6 (1.26-1.94)	<0.0001
Health Related Quality of Life						
EQ5D5L Index	71 (43.8%)	0.6 (0.2)	204 (100%)	0.7 (0.1)	0.1 (0.06-0.14)	<0.0001
MSK-HQ	31 (19.1%)	36.9 (9.5)		x	x	
Problem list						
Walking	106 (65.4%)		x			
Lying / Sleeping	98 (60.5%)		x			
Standing (including sit to stand)	79 (48.8%)		x			
Sitting / driving	39 (24.1%)		x			
Stairs	22 (13.6%)		x			
Exercise / hobbies	14 (8.6%)		x			
Squatting	10 (6.2%)		x			
Bending	7 (4.3%)		x			
Nil reported	4 (2.5%)		x			
Getting in / out of the car	2 (1.2%)		x			
Housework	1 (0.6%)		x			

3.2 Patient presentations

All patients presented with a primary complaint of lateral hip pain. Referred symptoms were common, as 30.2% of patients reported experiencing pain radiating to the lateral thigh (49/162). Associated lower back pain (LBP) was reported by 21.0% (34/162). Co-existing buttock pain / posterior hip (25/162; 15.4%); groin / anterior thigh pain (24/162; 14.9%); ipsilateral knee pain (14/162; 8.6%) and pain below the knee (12/162; 7.4%) were also reported (Fig 1).

Fig 1. Prevalence of referred symptoms of patients with GTPS



Patients with GTPS commonly reported problems with walking (106/162: 65.4%), lying / sleeping (98/162; 60.5%), standing (79/162; 48.8%) and sitting / driving (39/162; 24.1%). Subjects reported average pain scores of 6.5 (on a numerical rating scale out of 10) and health related quality of life scores of 0.6 (EQ5D5L).

Table 2. Medical History of subjects.

	No. of subjects	% of subjects	No. of complaints	% of total complaints
MSK	71	43.8%	108	30.9%
Lower limb osteoarthritis	25	15.4%	29	8.3%
Lower limb arthroplasty	19	11.7%	29	8.3%
Low back pain	19	11.7%	19	5.4%
PMR* /Fibromyalgia	5	3.1%	5	1.4%
Other	22	13.6%	27	7.7%
Cardiovascular	49	30.2%	60	17.1%
Digestion	31	19.1%	34	9.7%
Metabolic/ endocrine	29	17.9%	32	9.1%
Respiratory	20	12.3%	21	6.0%
Neoplasms	19	11.7%	21	6.0%
Nervous system	16	9.8%	16	4.6%
Mental Health	15	9.3%	17	4.9%
Gastro-intestinal	15	9.3%	16	4.6%
Blood	5	3.1%	5	1.4%
Visual	5	3.1%	7	2.0%
Ear	4	2.5%	4	1.1%
Sleep	2	1.2%	2	0.6%

One hundred and twenty-eight (79.0%) subjects reported suffering from 350 health complaints, other than lateral hip pain (Table 2). 56.8% (92/162) of subjects reported more than one health complaint and within that group, 14.1% (23/162) had four or more co-existing medical conditions. The most common complaints reported by subjects were musculoskeletal (71/162; 43.8%), cardiovascular (49/162; 30.2%), digestion (31/162; 19.1%) and metabolic / endocrine complaints (29/162; 17.9%). The 71 subjects, who reported co-existing musculoskeletal problems, reported 108 musculoskeletal complaints. Most commonly lower limb osteoarthritis (25/162; 15.4%), previous lower limb arthroplasty (19/162; 11.7%) and low back pain (19/162; 11.7%).

459 prescribed medications were taken by 134 (82.7%) subjects; with analgesics being the most commonly prescribed drug (Table 3). Opioid based analgesics (35.2%), non-opioid based analgesics (34.0%) and non-steroidal anti-inflammatory analgesics (23.4%) were the most commonly prescribed medications. The 108 subjects who were taking medication affecting the central nervous system; were taking 150 prescriptions of analgesics. On top of this a further 15 prescriptions of Tri-cyclic anti-depressants (such as Amitriptyline), and anti-convulsant medication (such as Gabapentyn) were taken by subjects. These medications are commonly prescribed for the management of persistent pain.

Other than analgesia; medications affecting the cardiovascular system (54/162; 34.9%) and hormone / endocrine system (30/162; 18.5%) were the most commonly prescribed medications.

Table 3 Medication taken by subjects.

	No. of subjects	% of subjects	No of prescriptions
Central Nervous System	108	66.7%	194
Opioid analgesics	57	35.2%	58
Non-opioid analgesics	55	34.0%	56
Non-steroidal anti-inflammatories	38	23.4%	40
Anti-depressants – SSRIs*	11	6.8%	11
Anti-convulsants	10	6.7%	10
Tri-cyclic antidepressants	4	2.5%	4
Other	15	9.3%	15
Cardiovascular System	54	30.9%	126
Statins	27	16.7%	29
Anti-platelet	19	11.7%	19
Angiotensin 2 blockers	18	11.1%	19
Ace inhibitors	15	9.3%	15
Calcium channel blockers	15	9.3%	15
Diuretics – Thiazides and loop diuretics	13	8.0%	13
Beta-blockers	7	4.3%	7
Other	9	0.6%	9
Hormone and endocrine system	30	18.5%	38
Diabetes altering medication	16	9.9%	16
Hypo-thyroid medication	11	6.8%	11
Female sex hormones	6	3.7%	6
Other	5	3.1%	5
Gastro-intestinal system	30	18.5%	41
Proton pump inhibitors	28	17.3%	29
Antacids	5	3.1%	5
Others	7	4.3%	7
Respiratory System	15	9.3%	23
Bronchodilators	11	6.8%	11
Inhalers (not specified)	4	2.5%	4
Other	8	4.9%	8
Musculoskeletal System	15	9.3%	17
Medication for bone disorders	10	6.2%	11
Others	6	3.7%	6
Nutrition	7	4.3%	7
Vitamins	7	4.3%	7
Malignant and immune disease	4	2.5%	4
Anti-cancer	4	2.5%	4
Reproductive / Urinary System	4	2.5%	4
Others	4	2.5%	4
Others	5	3.1%	5

The majority of patients (101/162; 62.3%) had undergone radiological investigations for their lateral hip pain as part of this or a previous episode of care, with almost 10% (15/162; 9.3%) having more than one investigation. X-ray (71/162; 44.3%) was the most commonly performed investigation, followed by MRI scan (32/162; 19.8%) and ultrasound scan (11/162; 6.8%).

At the point of assessment for the examined episode of treatment, 40.7% (66/162) of subjects had received previous treatment for lateral hip pain, most commonly physiotherapy (45/192; 23.4%) and corticosteroid injection (31/162; 19.1%). 10.5% (17/162) of subjects had received more than one type of intervention, and 8.6% (14/162) had received more than one corticosteroid injection.

As part of the examined episode of care, subjects underwent an average of 4.6 (SD 3.0) treatment sessions. The majority of physiotherapists treated subjects with strengthening / loading exercises (149/162; 92.0%) and education (77/162; 47.5%); whilst 12.0% (23/162; 14.2%) underwent corticosteroid injection.

Clinical outcome data in terms of a numerical rating scale (0-10 or 0-100), was available in 50.6% (82/162) of cases. Patients scoring 0, were deemed to have had 'no improvement', patients providing the maximum score were deemed to be 'completely resolved' and subjects who provided any scores in between these values, were categorised as having received 'some benefit' from treatment. In two cases (2/82; 2.4%), no numerical rating was provided, instead, it was described that the individual's symptoms had worsened with treatment. The majority demonstrated some improvement (48/82; 58.5%); with similar numbers experiencing no improvement (15/82; 18.3%) as those whose symptoms resolved (17/82; 20.7%).

4. DISCUSSION

The data from this service evaluation suggests that patients presenting to Physiotherapy services within the NHS with a primary complaint of GTPS have different characteristics than participants recruited to the LEAP trial. Comparisons suggest they are older (4.6 years), report higher levels of pain (VAS 1.5), have a higher BMI, and report lower health related quality of life (EQ5D Index 0.1).

Two recent systematic reviews reporting risk factors of persistent, non-malignant pain, suggest that these findings might be important, as people with musculoskeletal conditions who report higher levels of pain and disability at the outset, report poorer clinical outcomes (Artus et al., 2017; Valentin et al., 2016). One of the reviews also reported older age as an important prognostic factor (Valentin et al., 2016). Research looking at other lower limb tendinopathies suggests that the incidence is higher in older age groups, however age is not necessarily a causative factor (Longo et al., 2009; Maffuli & Kader, 2002). High body mass index (BMI) has not been demonstrated to be a significant prognostic indicator of persistent pain or tendinopathy, however this has not been examined in large cross-sectional studies of patients with GTPS (Artus et al., 2017; Fearon et al., 2012; Lievense et al., 2005; Valentin et al., 2016). Patients with GTPS have been demonstrated to have higher central adiposity than asymptomatic age matches controls; a finding which has been identified as a risk factor for the development of other tendinopathies (Fearon et al., 2012; Gaida, Ashe, Bass & Cook, 2009; Scott et al., 2015). The typical patient presenting to physiotherapy services in the NHS with GTPS had a higher BMI than the community dwellers recruited to the LEAP trial. Data from this and other studies suggests that the majority of patients with GTPS are 'overweight' according to their BMI (Mellor et al., 2018; Woodley et al., 2008).

This service evaluation suggests that a number of patients presenting to physiotherapy services in the NHS with GTPS experience referral of symptoms into the lateral thigh (30.2%), lumbar spine (21.0%), buttock (15.4%) and groin (14.9%). This is not a surprise given that so many patients experience pain lasting more than 12-months (56.8%) and the central nervous system adaptations

which occur with persistent pain (Vardeh et al., 2017). The co-existence of LBP and GTPS is well established, although not well understood or researched, as patients with LBP are often excluded from trials (Tan et al., 2018; Tortolani, Carbone, & Quartararo, 2012). In this evaluation, 11.7% of patients suffered persistent LBP and 21.0%, suggested that they experienced back pain alongside their lateral hip pain. In a study of 40 patients seeking healthcare with GTPS; 30% experienced co-existing low back pain and 75% had experienced an episode of low back pain in the previous 2 years (Woodley et al, 2008). Patients were excluded from the LEAP trial if they experienced more than 2/10 pain on lumbar spine flexion (Mellor et al., 2016); suggesting that there may be an important group of patients seen in the NHS that were excluded from the LEAP trial.

Nearly half (43.8%) of the patients with GTPS in this service evaluation were also likely to have other musculoskeletal pain problems, including previous arthroplasty (11.7%) and lower limb osteoarthritis (15.4%). Patients with groin pain (>2/10 average intensity over a week) or reduced hip range of motion (<90 degrees flexion) were excluded from the LEAP trial as symptoms from osteoarthritis can often mimic GTPS (Mellor et al., 2016). Our data suggests that groin pain (14.9%) and osteoarthritis of the lower limb (15.4%) appear to co-exist with GTPS in a number of cases; a finding supported by other research (Albers, Zwerver, Diercks, Dekker, & Van Der Akker-Scheek, 2016; Lievense et al., 2005; Segal et al., 2007). This may be significant as Lievense et al, (2005), found that patients with co-existing GTPS and lower limb OA, were almost five times (x4.77) more likely to have symptoms persisting at twelve months. Lower extremity OA appears to co-exist with GTPS in a substantial proportion of patients, and research is required to ascertain how current rehabilitative strategies affect this specific sub-group.

71 subjects in this service evaluation reported 108 different musculoskeletal pain problems. The data in this evaluation on the prevalence of referred symptoms and co-existing musculoskeletal pain problems is significant, as widespread pain has been established a predictor of longer term musculoskeletal pain (Artus et al., 2017; Valentin et al., 2016). Overall, patients attending NHS

physiotherapy services appear to have co-existing musculoskeletal pain problems. These patients were excluded from the LEAP trial

Seventy-one (43.8%) patients completed the EQ5D, quality of life questionnaire in this study. On average patients were likely, to have a lower EQ5D index score (0.6), than those in the LEAP trial (0.7). This difference is in line with the suggested minimally important clinical difference (MCID) reported for patients with persistent pain (Corett & Ruggeri, in press). What is clear is that these patients experience significantly worse quality of life, than the population norm for adults between the ages of 55-64 in the UK (0.804). This is not the first study to establish that patients with GTPS experience poor quality of life, as Fearon et al (2014), reported that patients with GTPS reported similar quality of life scores, to those with advanced osteoarthritis of the hip. This study supports other data which suggests that lateral hip pain is intrusive, as activities such as walking (65.4%) and lying (60.5%) are problematic for the majority of sufferers (Woodley et al, 2008).

The co-morbidities and medication data recorded in this evaluation, suggests that this diminished quality of life may be multi-factorial. 128 subjects suffered 350 medical conditions, including cardiovascular complaints (30.2%), digestion problems (19.1%) and metabolic / endocrine disorders (17.9%) which have all been linked to tendinopathy (Abate et al, 2013). On top of this, 134 subjects were taking 459 prescriptions; and were commonly taking statins (16.7%) and angiotensin 2 blockers (11.1%), which have also been linked with the development of tendinopathy and tendon rupture (Kirschgesner et al., 2014; Nyyssonen et al., 2018). It is unknown whether these medications influence rehabilitative outcomes for GTPS.

More than one third of subjects (35.2%) were taking opioid medication despite current guidelines suggesting these medications should be used judiciously due to side effects and lack of clinical efficacy with their long-term usage (Els et al., 2017; NICE, 2019).

The burden of managing patients with GTPS for the NHS remains unknown. However, this service evaluation suggests that they frequently suffer high levels of pain and disability and often have symptoms lasting more than 12-months; whilst being on high levels of medication for a range of medical conditions. They also frequently undergo radiological imaging (62.3%), despite evidence that clinical examination is sufficient (Fearon et al., 2013; Ganderton, Semciw, Cook & Pizzari, 2017; Grimaldi et al., 2017) and are treated in a variety of ways including cortico-steroid injections (19.1%), despite a lack of proven efficacy (Brinks & Denman, 2011; Rompe et al., 2009). The data in this study importantly suggests that patients presenting to physiotherapy services in the NHS with GTPS are potentially different in clinically important ways than those recruited to the LEAP trial, and have multidimensional needs which may need to be addressed as part of their treatment. Hence, it is unclear whether the findings of the LEAP trial are applicable to patients with GTPS consulting physiotherapy services in the NHS. Further research is warranted to evaluate this.

Limitations

This service evaluation relied on data from patient records that is dependent on the thoroughness of the documentation of the treating clinician. Methods to select patient records from sites were not standardised which could introduce some selection bias. Also, the diagnosis of GTPS was not standardised, but previously a large survey of current practice suggests that physiotherapists felt confident to diagnose the condition in a reasonably consistent manner (Stephens et al, 2019).

5. CONCLUSION

Patients presenting to the NHS with GTPS appear to have complex, multi-factorial issues with high levels of pain and disability and are often medicated for multiple co-existing conditions. Importantly, they have characteristics which differentiate them from patients recruited to the LEAP trial, Hence, it is unclear whether the findings of the LEAP trial are applicable to patients with GTPS consulting physiotherapy services in the NHS. Further research is warranted to evaluate this.

Appendix 1. Data capture tool

[illegible]

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